CMT20P60K

20V P-Channel MOSFET

Description

Features

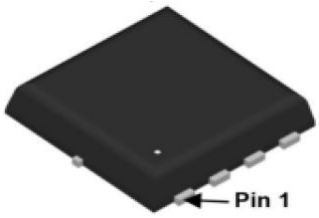
- Trench Power LV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low RDS(ON)

Application

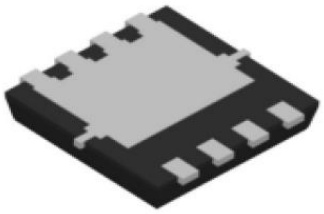
- High current load application
- Load switching
- Quick Charge

V_{DS}	-20	V
$R_{ds(on),typ}$@V_{gs}=-4.5V	5.2	mΩ
$R_{ds(on),typ}$@V_{gs}=-2.5V	7.2	mΩ
I_D	-60	A

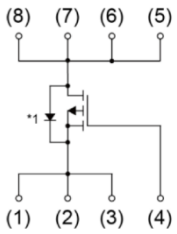
Top View



Bottom View



Pin Configuration



Package Marking and Ordering Information

Part	Marking	Package	Packing	Reel Size	Tape Width	Qty
CMT20P60K	T20P60K	PDFN3.0*3.0	Reel	NA	NA	5000pcs

Key Performance Parameters

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±10	V
ID@Tc=25℃	Continuous Drain Current, V_{GS}=-4.5V	-60	A
ID@Tc=100℃	Continuous Drain Current, V_{GS}=-4.5V	-54	A
IDM	Pulsed Drain Current[1]	-240	A
EAS	Single Pulse Avalanche Energy[4]	90	mJ
PD@Tc=25℃	Total Power Dissipation	66	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_j	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ	Max	Units
$R_{\theta JC}$	Thermal Resistance Junction-Case	1.6	1.9	℃/W

Electrical Characteristics (T_J=25 ℃, Unless otherwise noted)

Symbol	Parameter	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
BVDSS	Drain-Source Breakdown Voltage	-20	--	--	V	V_{GS}=0V, I_D=-250uA
$R_{DS(ON)}$	Static Drain-Source On-Resistance	--	5.2	8	mΩ	V_{GS}=-4.5V, I_D=-15A
		--	7.2	12		V_{GS}=-2.5V, I_D=-12A
$V_{GS(th)}$	Gate Threshold Voltage	-0.5	-0.9	-1.2	V	V_{GS}=V_{DS}, I_D=-250uA
IDSS	Drain-Source Leakage Current	--	--	-1	uA	V_{DS}=-20V, V_{GS}=0V, T_J=25℃
		--	--	-10	uA	V_{DS}=-16V, V_{GS}=0V, T_J=125℃
IGSS	Gate-Source Leakage Current	--	--	±100	nA	V_{GS}=±10V, V_{DS}=0V
Qg	Total Gate Charge	--	56	--	nC	V_{DS}=-10V, V_{GS}=-4.5V, I_D=-15A
Qgs	Gate-Source Charge	--	8	--		
Qgd	Gate-Drain Charge	--	16	--		
$Td_{(on)}$	Turn-On Delay Time	--	12	--	ns	V_{DD}=-10V, V_{GS}=-4.5V, R_G=2.7Ω I_D=-13A
T_r	Rise Time	--	112	--		
$Td_{(off)}$	Turn-Off Delay Time	--	156	--		
T_f	Fall Time	--	160	--		
Ciss	Input Capacitance	--	3947	--	pF	V_{DS}=-10V, V_{GS}=0V, f=1MHz
Coss	Output Capacitance	--	530	--		
Crss	Reverse Transfer Capacitance	--	396	--		

Diode Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Is	Continuous Source Current	VG=VD=0V, Force Current	--	--	-60	A
Ism	Pulsed Source Current		--	--	-240	A
Trr	Body Diode Reverse Recovery Time	IF=-15A, di/dt=100A/us	--	22	--	ns
Qrr	Body Diode Reverse Recovery Charge		--	15	--	nC
V_{SD}	Diode Forward Voltage	VGS=0V, I_S=-15A, TJ=25℃	--	--	-1.2	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width ≦300us, duty cycle ≦2%.
3. Essentially independent of operating temperature.
4.The EAS data shows Max. rating. The test condition is V_{DD}=-10V, V_{GS}=-4.5V, L=0.5mH.

Typical Performance Characteristics

Fig1 Output Characteristics

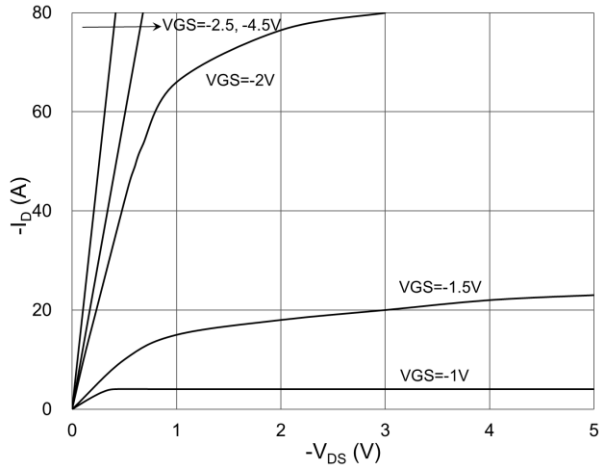


Fig2 Normalized R_{DSON} vs. T_J

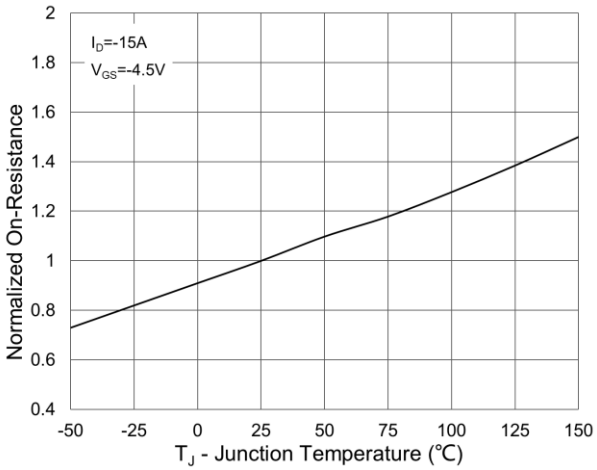


Fig3 Gate Charge Waveform

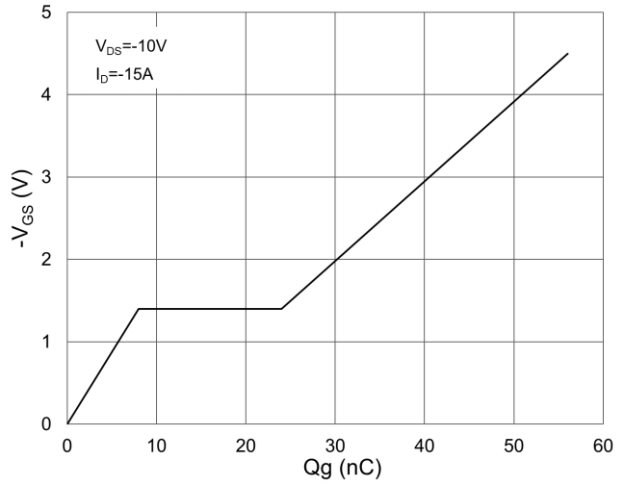


Fig4 Transfer Characteristics

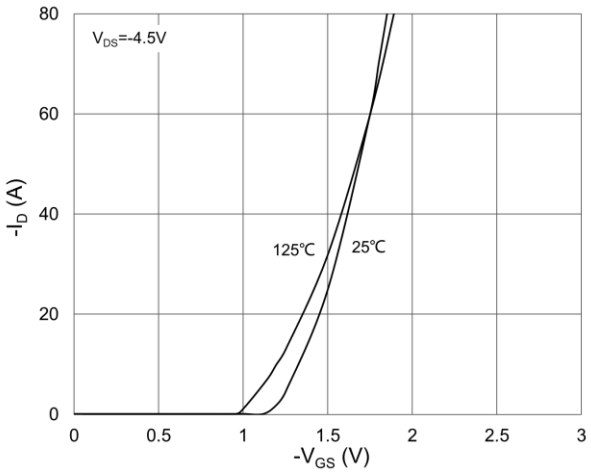


Fig5 Rds(on) vs. Drain Current and Gate Voltage

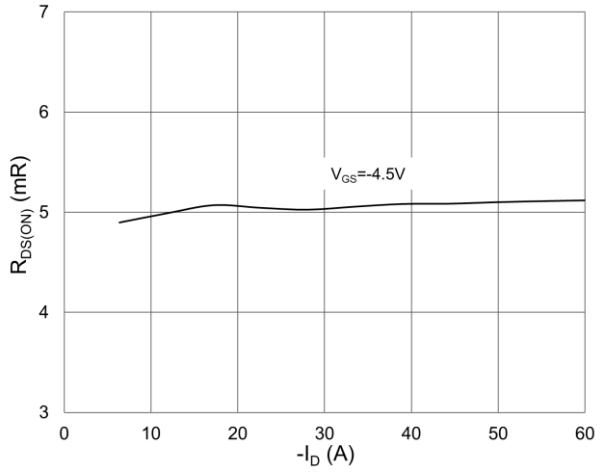


Fig6 Capacitance Characteristics

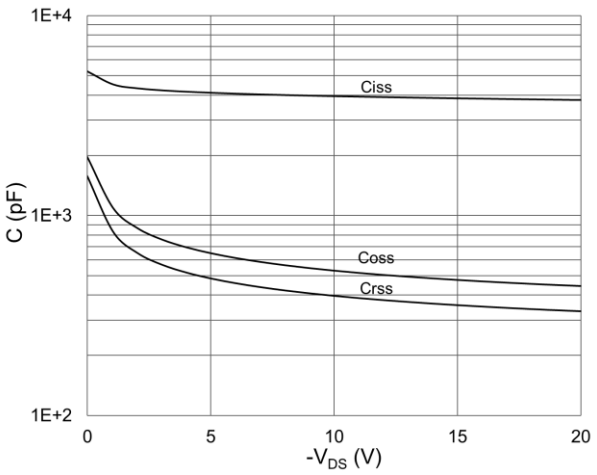


Fig7 Drain Current Derating

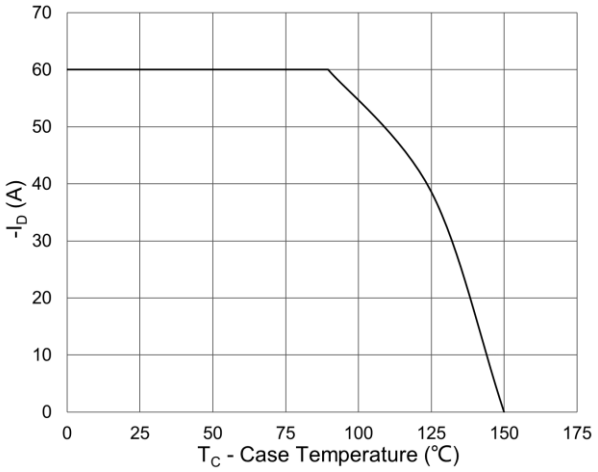


Fig8 Power Dissipation

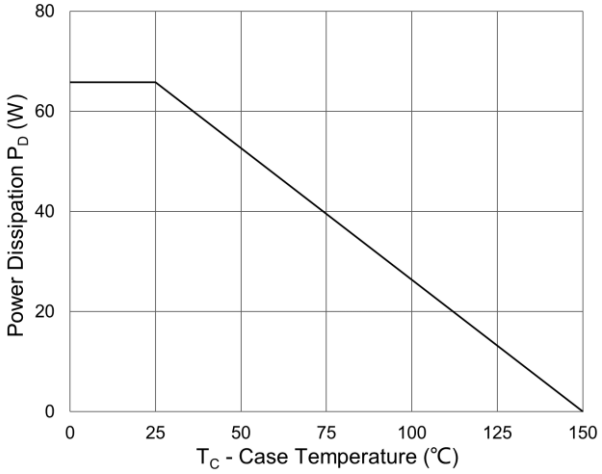


Fig9 Source-Drain Diode Forward Characteristics

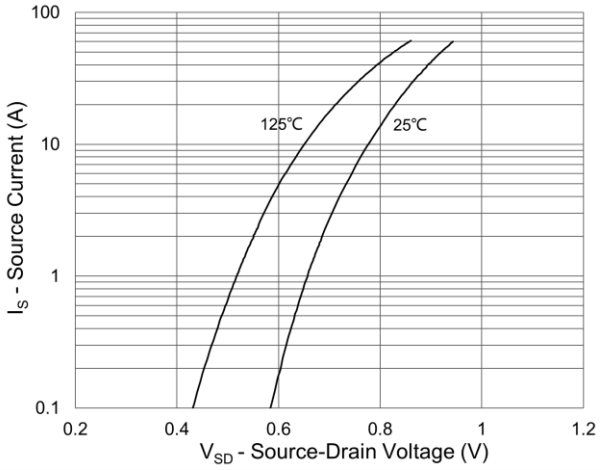


Fig10 Normalized Threshold Voltage vs. T_J

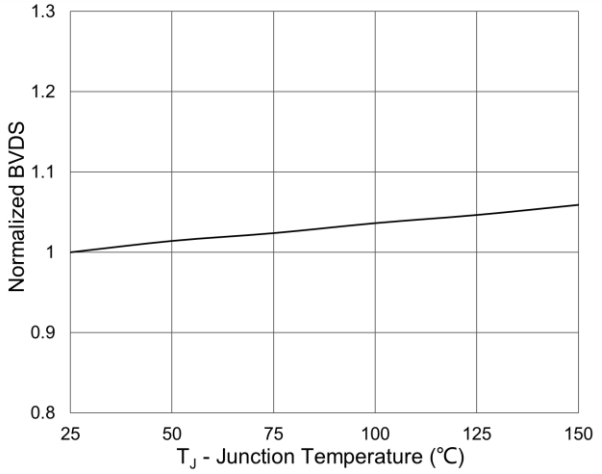


Fig11 Maximum Safe Operation Area

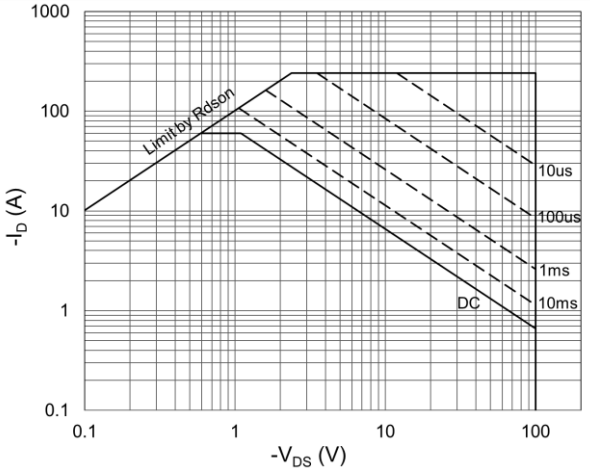


Fig12 Normalized Threshold Voltage vs. T_J

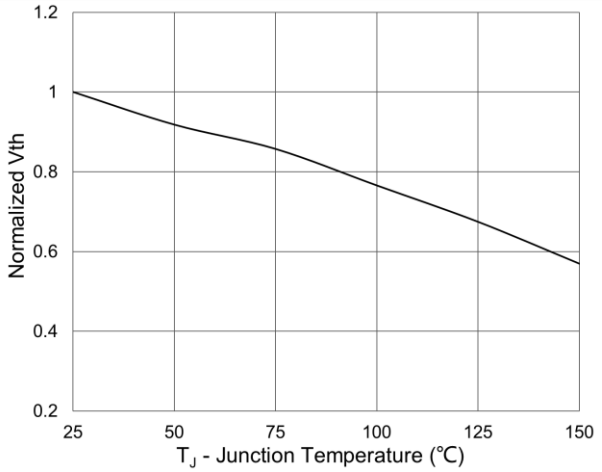
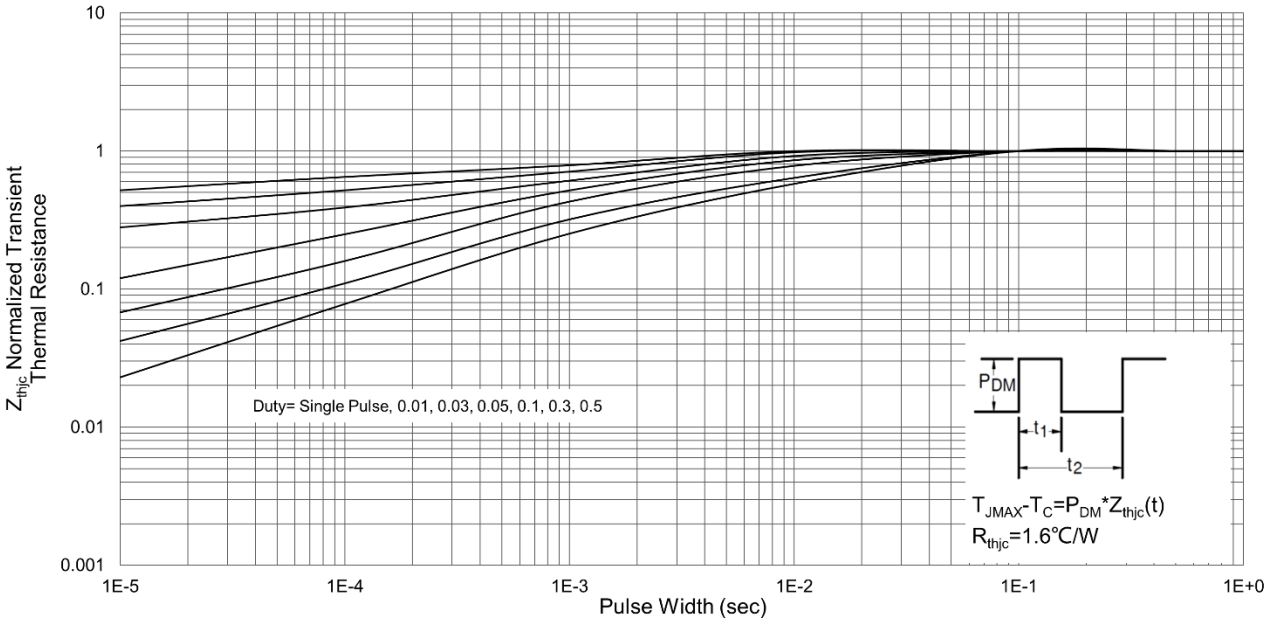
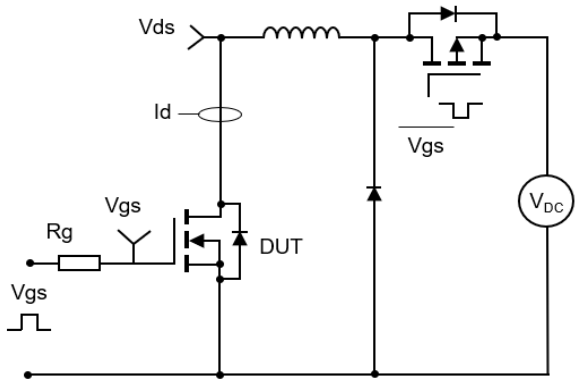


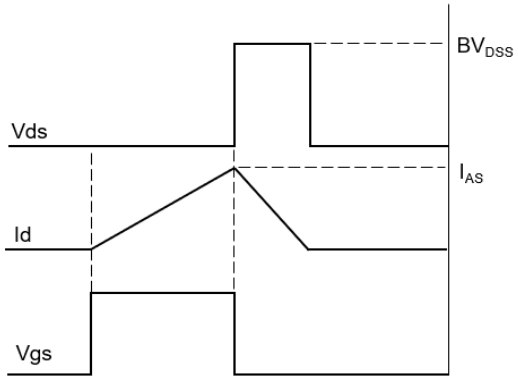
Fig13 Normalized Transient Impedance



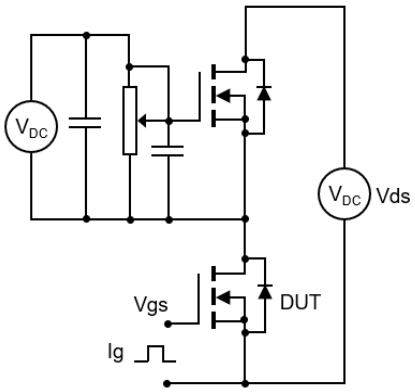
Test Circuit & Waveform

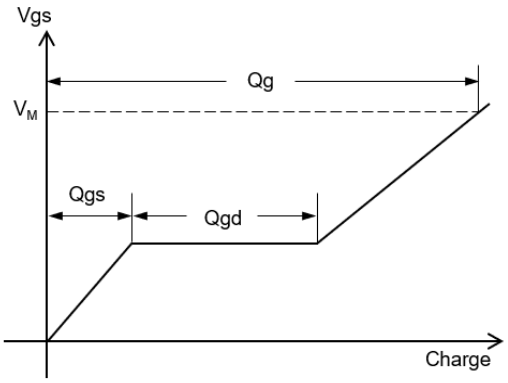
1. Unclamped Inductive Switching Test Circuit & Waveform



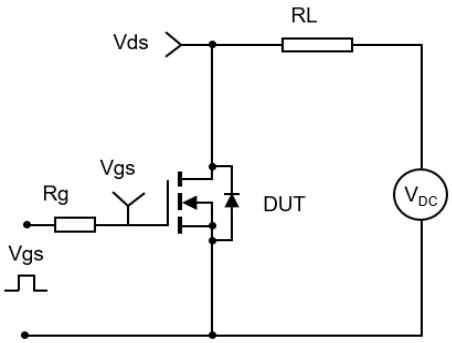


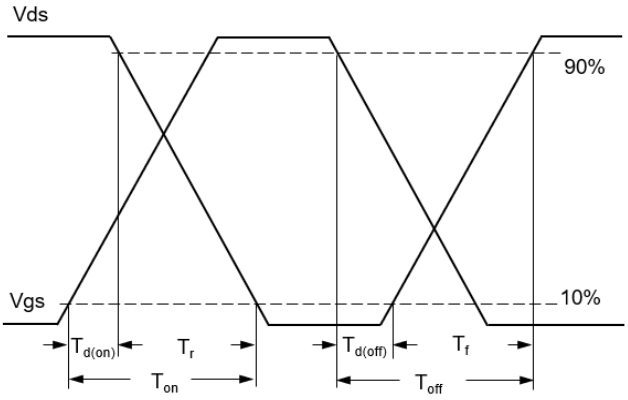
2. Gate Charge Test Circuit & Waveform



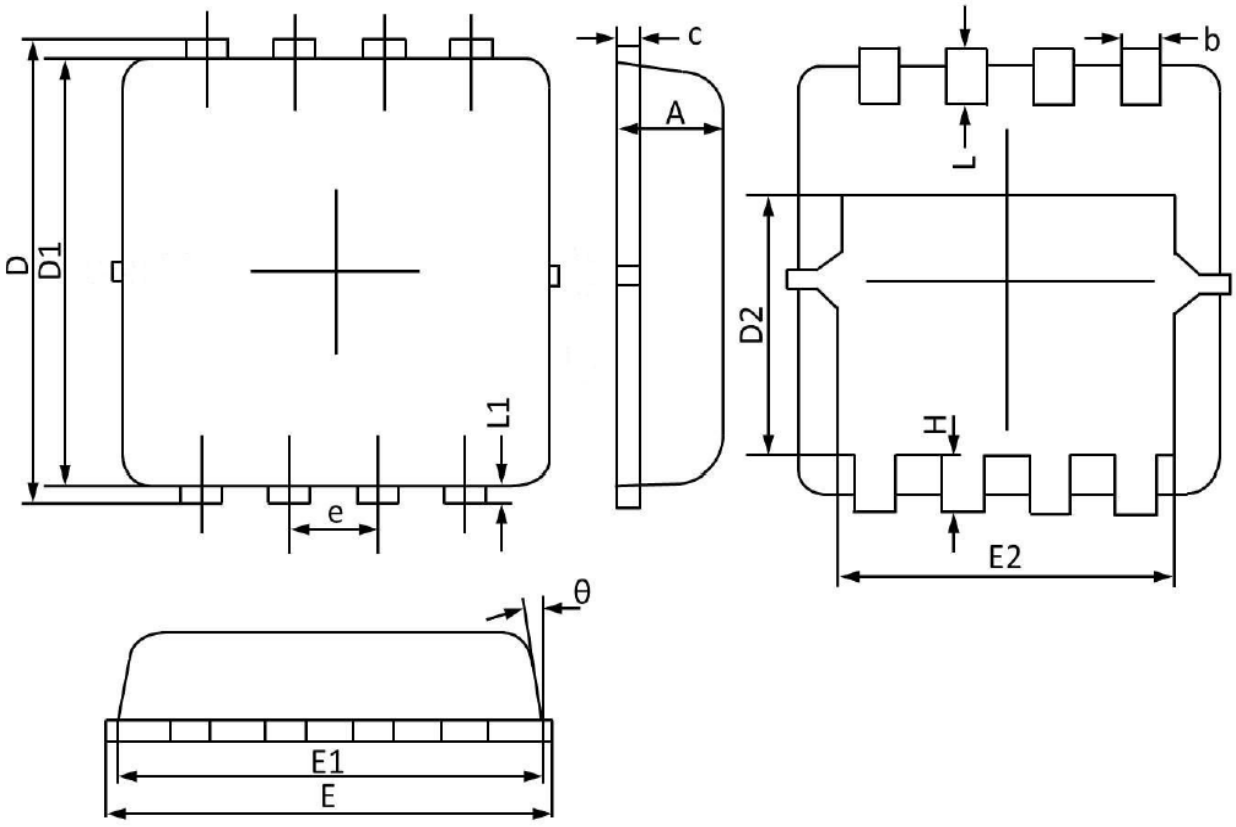


3. Resistive Switching Test Circuit & Waveform





PDFN3*3 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.900	0.700	0.035	0.028
b	0.350	0.240	0.014	0.009
c	0.250	0.100	0.010	0.004
D	3.450	3.050	0.136	0.120
D1	3.200	2.900	0.126	0.114
D2	1.850	1.350	0.073	0.053
E	3.400	3.000	0.134	0.118
E1	3.250	2.900	0.128	0.114
E2	2.600	2.350	0.102	0.093
e	0.65BSC		0.026BSC	
H	0.500	0.300	0.020	0.012
L	0.500	0.300	0.020	0.012
L1	0.200	0.070	0.008	0.003
θ	12°	0°	12°	0°